

U.S. Patent Application Serial No. 10/664,933
Preliminary Amendment

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-17 (canceled).

Claim 18 (new): A printed circuit board unit with a cooling device comprising:
a printed circuit board;
a ventilation fan coupled to the printed circuit board for relative rotation to the printed circuit board, said ventilation fan having a rotation axis and a direction of said rotation axis intersecting the printed circuit board;
a housing wall standing from a surface of the printed circuit board at a periphery of the ventilation fan;
a ceiling wall connected to an upper end of the housing wall and extending along a datum plane parallel to the surface of the printed circuit board;
an inlet defined in the ceiling wall;
an outlet defined in the housing wall;
an electronic component mounted on the printed circuit board; and

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an electrically conductive wiring pattern extending over the surface of the printed circuit board inside the housing wall and connected to the electronic component.

Claim 19 (new): An electronic apparatus comprising:

printed circuit board;

a ventilation fan coupled to the printed circuit board for relative rotation to the printed circuit board, said ventilation fan having a rotation axis and a direction of said rotation axis intersecting the printed circuit board;

a housing wall standing from a surface of the printed circuit board at a periphery of the ventilation fan;

an outlet defined in the housing wall;

an electronic component mounted on the printed circuit board;

an electrically conductive wiring pattern extending over the surface of the printed circuit board inside the housing wall and connected to the electronic component;

a radiation fin connected to the electrically conductive wiring pattern; and

an electronic component mounted on the printed circuit board inside the housing wall.

Claim 20 (new): An electronic apparatus comprising:

a printed circuit board;

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a ventilation fan coupled to the printed circuit board for relative rotation to the printed circuit board, said ventilation fan having a rotation axis intersecting the printed circuit board;

 a housing wall standing from a surface of the printed circuit board at a periphery of the ventilation fan;

 an outlet defined in the housing wall;

 a ceiling wall connected to an upper end of the housing wall and extending along a datum plane parallel to the surface of the printed circuit board;

 a first inlet defined in the ceiling wall; and

 a second inlet defined in the printed circuit board inside the housing wall.

Claim 21 (new): The electronic apparatus according to claim 20, further comprising:

 an electronic component mounted on the printed circuit board; and

 an electrically conductive wiring pattern extending over the surface of the printed circuit board inside the housing wall and connected to the electronic component.

Claim 22 (new): The electronic apparatus according to claim 21, further comprising a radiation fin connected to the electrically conductive wiring pattern.

Claim 23 (new): The electronic apparatus according to claim 22 , further comprising an electronic component mounted on the printed circuit board inside the housing wall.

Claim 24 (new): An electronic apparatus comprising:

a printed circuit board;

a housing coupled to the printed circuit board;

a rotary shaft supported for rotation by the housing, said rotary shaft having a rotation axis intersecting the printed circuit board;

a rotary member mounted on the rotary shaft;

blades fixed to the rotary member; and

an inlet defined in the printed circuit board inside the housing.

Claim 25 (new): A printed circuit board unit with a cooling device, comprising:

a printed circuit board;

a ventilation fan coupled to the printed circuit board for relative rotation to the printed circuit board, said ventilation fan having a rotation axis and a direction of said rotation axis intersecting the printed circuit board;

a housing wall standing from a surface of the printed circuit board at a periphery of the ventilation fan;

an outlet defined in the housing wall;

an electronic component mounted on the printed circuit board outside the housing wall; and

an electrically conductive wiring pattern extending over the surface of the printed circuit board inside the housing wall and connected to the electronic component.

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Claim 26 (new): The printed circuit board unit with the cooling device according to claim 25, further comprising a radiation fin connected to the electrically conductive wiring pattern.

Claim 27 (new): The printed circuit board unit with the cooling device according to claim 25, wherein the electronic component is a central processing unit.

Claim 28 (new): A printed circuit board unit with a cooling device, comprising:
a printed circuit board;
a ventilation fan coupled to the printed circuit board for relative rotation to the printed circuit board, said ventilation fan having a rotation axis and a direction of said rotation axis intersecting the printed circuit board;
a housing wall standing from a surface of the printed circuit board at a periphery of the ventilation fan;
an outlet defined in the housing wall;
an electronic component mounted on the printed circuit board; and
an electrically conductive wiring pattern extending over the surface of the printed circuit board inside the housing wall and connected to the electronic component so as to serve as a ground wire.

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Claim 29 (new): The printed circuit board unit with the cooling device according to claim 28, wherein the electronic component is a central processing unit.

Claim 30 (new): An electronic apparatus comprising:

 a printed circuit board;

 a ventilation fan coupled to the printed circuit board for relative rotation to the printed circuit board, said ventilation fan having a rotation axis and a direction of said rotation axis intersecting the printed circuit board;

 a housing wall standing from a surface of the printed circuit board at a periphery of the ventilation fan;

 an outlet defined in the housing wall;

 an electronic component mounted on the printed circuit board outside the housing wall; and

 an electrically conductive wiring pattern extending over the surface of the printed circuit board inside the housing wall and connected to the electronic component.

Claim 31 (new): The electronic apparatus according to claim 30, further comprising a radiation fin connected to the electrically conductive wiring pattern.

Claim 32 (new): The electronic apparatus according to claim 30, wherein the electronic component is a central processing unit.

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Claim 33 (new): An electronic apparatus comprising:

a printed circuit board;

a ventilation fan coupled to the printed circuit board for relative rotation to the printed circuit board, said ventilation fan having a rotation axis and a direction of said rotation axis intersecting the printed circuit board;

a housing wall standing from a surface of the printed circuit board at a periphery of the ventilation fan;

an outlet defined in the housing wall;

an electronic component mounted on the printed circuit board; and

an electrically conductive wiring pattern extending over the surface of the printed circuit board inside the housing wall and connected to the electronic component so as to serve as a ground wire.

Claim 34 (new): The electronic apparatus according to claim 33, wherein the electronic component is a central processing unit.

Claim 35 (new): An electronic apparatus comprising:

an enclosure;

a printed circuit board disposed within the enclosure;

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a ventilation fan coupled to the printed circuit board for relative rotation to the printed circuit board, said ventilation fan having a rotation axis and a direction of said rotation axis intersecting the printed circuit board;

a housing wall standing from a surface of the printed circuit board at a periphery of the ventilation fan;

a ceiling wall connected to an upper end of the housing wall and extending along a datum plane parallel to the surface of the printed circuit board;

an inlet defined in the ceiling wall and opposed to an inner surface of the enclosure;

an outlet defined in the housing wall;

an electronic component mounted on the printed circuit board; and

an electrically conductive wiring pattern extending over the surface of the printed circuit board inside the housing wall and connected to the electronic component.

Claim 36 (new): The electronic apparatus according to Claim 35, wherein the inner surface of the enclosure is flat.